

EASTERN UTAH'S OZOKERITE MINES, AND THEIR OUTPUTS

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In the Salt Lake Mining Review.

It is curious to note how little is generally known of the sources of supply of most of the necessities and luxuries of life. There are hundreds of commodities which we use every day concerning which we give hardly a thought, and, if we were asked regarding their source, whether derived originally from Mother Earth, the forests or fields, or mysteriously flicked from the air, many there are who could not give a correct or satisfactory answer.

Such is the case with ozokerite, or mineral wax. The reader will naturally say: "Why, I never heard of ozokerite; and, if I have ever had occasion to use it in any form, I never knew it." And yet, at the same time, he may be using the telephone or listening to a rendition of "Everybody's Doing It" by his megaphone or victrola, little

the need instead of giving it a metallic surface coating. Ozokerite is also used in lining tanks in which powerful acids are to be mixed. It is estimated that three-fourths of the candles used in the churches in this and other countries are made of ozokerite or of beeswax strongly adulterated with ozokerite. The illuminating power of such candles is stronger than that of others, while they drip but little and never lop over when exposed to ordinary atmospheric heat. All wax figures and wax dolls are made of ozokerite. It also enters into the manufacture of imitation alabaster statuettes and the elaborate decorations which sometimes adorn wedding cakes and other confections. Among other uses to which it is put are making of liniments, salves and plasters, sealing wax, wax matches, life preservers, boot blocking, varnish and shoemakers' wax.

pitch, which is used in making cable insulations. Edison gives the resistance of crude ozokerite as 150,000,000 megohms per centimeter, while that of paraffine is only 110,000,000, which illustrates the superior quality of the former when compared with the latter.

Properties of Ozokerite.

Refined ozokerite varies considerably in appearance and it is almost impossible to find two samples, taken from different mines, which are exactly alike. The color varies to a remarkable extent ranging from a pale yellow to a dark yellow, more or less pure brown and green of all shades and black. Crystalline or refined ozokerite forms white, amorphous masses, in contrast to crystalline paraffine, greatly resembling beeswax in appearance. As

exist, the field is so extensive that an industry could be established that would make our state as noted and famous for the production of this commodity as it now is in its yield of gold, silver, lead, copper, coal and other minerals. In describing this great ozokerite zone, R. J. Kroupa, one of the prominent engineering chemists of the United States, says:

"The Utah ozokerite belt or wax zone extends from about one mile west of Media on the Denver and Rio Grande railroad, along the southern and western slope of the Wasatch range to Soldier Summit and across to about two miles north-easterly from Colton, extending through Utah and Wasatch counties, in all a distance of twelve miles, and not exceeding at any point from one to two miles in width."

"The zone is located in a great fault such as are common in the Wasatch range, and the fractures that hold the ozokerite in this belt cut transversely or across the great fault. This great fault has an important bearing on the presence of this wax. When you leave this fault for a certain distance no trace of wax is found. All the development work done in this belt up to the present time is in these fractures or veins. The largest body of wax struck in the wax belt, up to the present time, was in the shoot on

are at an angle of forty-five to sixty degrees as a rule. I have never found in the Carpathian range such a block system or uplifting as there is in the Wasatch range in Utah. This geological feature makes the mining in the Wasatch range most economical. The east half of the Carpathian Mountains is a great oil field and oil derricks are scattered from the foothills to the interior. The output of oil is extensive in some places and small in others. Some gushers have been struck, and the Galician field has developed into one of the most important and valuable oil fields in Europe. The town of Boryslaw is situated in the foothills, on the north flanks of the range, and about forty miles southwest of Lemberg (Galicia) and on the line of a railroad.

"At the time of my examination of these properties, the town had a population of about twelve thousand, most all of whom were working in the mines and on surface work. The ozokerite is found in the shales and sandstone with oil and salt water. The mining is all done by shaft work, and at the time of my visit was at a depth of about eight hundred feet. Since that time they have gone down to a depth of fourteen hundred feet in shaft mining and about three thousand feet by drilling."



Ozokerite Occurrences in the Vein. American Ozokerite Company.



A Portion of the Working Force at the Pleasant Valley Plant.

dreaming that the receiver of the telephone or the record on the phonograph are largely made from the material (ozokerite) in its refined form, or that ozokerite enters into his daily life in a hundred or more ways. Nor does he realize that there are only two places in the known world where ozokerite exists in a natural or original state, Austria, and in Utah, United States of America.

Ozokerite is a mineral wax found in commercial quantities in Boryslaw (Austria) and in the near vicinity of Colton, Utah. Even in technical and engineering circles but little is known regarding this substance, which is defined by the New Standard Encyclopedia as follows:

Ozokerite Or Mineral Wax.

"A valuable mineral found in large deposits in Utah and in the Austrian province of Galicia. It is impossible to enumerate all the uses to which ozokerite can be put. As the rival of beeswax it has already materially reduced the price of that product, but ceresine possesses many valuable qualities not found

in other waxes. Its melting point is high, from 155 to 190 degrees Fahrenheit. It is plastic without being soft, and hard without brittleness. It decolorizes without destructive distillation. Alkalies and the stronger acids make no impression on it, and when refined it is odorless and is used for the insulation of electric wires. It is valuable for all kinds of waterproofing, and papers waxed with it are being largely used in wrapping soap, stoves, boxes and all kinds of articles that require protection from moisture. Boxes, barrels and kegs lined with it are perfectly tight and it imparts no unpleasant flavor to the contents, even in the case of the most delicate mineral water.

Uses of Ozokerite.

The largest consumers of ozokerite in the United States are large electrical concerns, who utilize it in great quantities, for insulating purposes, as it is the best material known for the weatherproofing of wires. It is also used, with certain compounds, for the manufacturing of the hard rubber used in making telephone receivers and transmitters. It is used in electrotyping, phonograph cylinders or records, shoe polish, waterproof crayons, buttons and in the manufacturing of innumerable articles which, otherwise, would have to be made from animal or vegetable waxes.

Ceresine, of which ozokerite is very largely composed, is used extensively in the trades and arts. For instance, because of its ease of manipulation, the possibility of its incorporation with resins, fats and oils, by simply melting, and of standing to any desired color, and because of its power of retarding acids, it can be applied to such a variety

of uses, and it is in such demand that the supply falls far short in the markets of the world. Ceresine is a substitute for carnauba, while it is used as a floor polish wax, shoe polish, shoe and leather polish, in making moulding mass for copper and silver plating, as an artificial wax moulding composition, ceresine moth papers, for waterproofing cartridges, waterproofing textile fabrics, in the manufacture of a preservative compound for sole leather, dressing for calico shirtings, stiff dressing for imitation linen, dressing for black cotton goods, pencils for writing on glass and porcelain, wax for sealing bottles and fruit jars. In the distillation of ceresine from ozokerite the residue forms what is known as wax

of fact, beeswax can be adulterated with 20 per cent of ceresine without changing its physical properties in the least. Ceresine, with a melting point of 157 degrees Fahrenheit, has the same fracture and structure as beeswax.

Austrian Ozokerite Field.

The history of ozokerite mining at Boryslaw (Austria) is a very interesting one. In the years 1821 and 1843 licenses were granted for working the mountain tar, and the first discovery of ozokerite was made in the year 1854. At first the native peasantry confined their efforts to collecting petroleum, which was sold in a thick state as rapa (carr grease), and in a more fluid condition as kipska, leather grease. In 1863 this petroleum was first distilled for the production of paraffine. The inauguration of this industry led to indiscriminate working, and very soon the entire district around Boryslaw was covered with shafts, some fifteen hundred in number, and only a few feet apart. After the Austrian government had brought ozokerite mining under

the property at Soldier Summit, and there have been taken large bodies of almost pure wax from the various properties extending from Media to the Acme property to the various properties around Colton.

"The fault above referred to passes through the Acme property at Media or Midway, thence east through the Soldier Summit property, thence southeast through the Colton properties of the American Ozokerite Company. I am satisfied from past development that there are a large number of these fractures, called blind veins, across this great fault, and that a gradual development of these fractures or veins by deep shaft mining and drifting on the vein will finally cut into the fault system, which I believe will be found to be the source of all of the ozokerite in the wax zone."

Austrian Ozokerite.

"A number of years ago I made a special trip to Europe for the explicit purpose of making a thorough investigation of the European wax fields. I spent about eight months

"The wax, as extracted, comes in a brecciated form, mixed in shale and sandstone as well. The lump form of wax, as a rule, is soft, and is something like butter half way hard. Part of this wax comes into the drifts from the crevices in the walls and fills up the drifts charged with oil and gas. Sometimes this exudation of wax comes so suddenly that the miners have to leave the mine, and afterwards the oil has to be pumped out. At one time a large body of this soft wax, called at the mines blaasen wach (blow wax), filled the drift, shaft and house over night to a depth of over eight hundred feet. All the wax hauled from the shafts is sorted and the brecciated matter is placed in large cast iron caldrons containing hot water. The wax was skimmed from the surface, remelted, and cast into wooden tubs. A large amount of black oil called kinderbal was also produced and was dense, like molasses, and was used to adulterate the wax, and the cakes were shipped to the refineries in different parts of Europe."



Lower Tunnel Workings, Boarding House and Power Plant.



MdI and Refinery at Pleasant Valley Plant.

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strict supervision, a monopoly of the business was acquired by the Linder bank of Vienna, which is today operating the properties.

The industry in the Austrian field is comparatively small when compared with the extensive area embraced in the Utah field, and the deposits are not nearly so large. At Boryslaw the industry supports a population of twelve thousand and the entire output, in date, aggregates something over eighty million dollars.

The Utah Ozokerite Field.

Comparing the Utah to the Austrian ozokerite field even the layman can see the wonderful possibilities possessed by the former. At Colton, near which place almost inexhaustible deposits of ozokerite

is going over the various properties in Galicia, going underground in all the properties that were open, and also made a careful research in the refining of the product into ceresine and its various allied products, going into every detail of the business, from the mining, refining, chemistry and geology, to the marketing of the material. This trip was made for the purpose of comparison with the Utah fields and to aid the development thereof.

"The Carpathian mountain range is in Northern Austria (Europe) and has an easterly and westerly course. Its formation is sedimentary and is a tertiary shale and sandstone and fossil limestone. The formation is very much disrupted and uplifted. The uplifted strata

Utah and Austrian Fields.

"As to geological conditions the two fields are identical as to formation and disposition of the wax, but the Utah field or wax belt covers a much larger area than the entire Austrian field. The nature of the occurrence of the wax in Utah is the same as found in Austria in every respect, and with the oil that is encountered in the various Utah properties, even with the shallow development, it indicates that the same conditions will be found here, with depth, as exist in the Austrian fields."

American Ozokerite Company.

The largest producer of ozokerite in the United States is the

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